

US009510865B2

# (12) United States Patent

Elsebaie et al.

# (54) GROWTH DIRECTED VERTEBRAL FIXATION SYSTEM WITH DISTRACTIBLE CONNECTOR(S) AND APICAL CONTROL

(71) Applicant: **K2M, Inc.**, Leesburg, VA (US)

(72) Inventors: **Hazem Elsebaic**, Giza (EG); **Behrooz Akbarnia**, La Jolla, CA (US)

(73) Assignee: **K2M, Inc.**, Leesburg, VA (US)

(\*) Notice: Subject to any disclaimer, the term of this

patent is extended or adjusted under 35

U.S.C. 154(b) by 74 days.

(21) Appl. No.: 14/480,047

(22) Filed: Sep. 8, 2014

(65) Prior Publication Data

US 2014/0379033 A1 Dec. 25, 2014

#### Related U.S. Application Data

(60) Division of application No. 12/873,582, filed on Sep. 1, 2010, now Pat. No. 8,828,058, which is a continuation-in-part of application No. PCT/ US2009/063833, filed on Nov. 10, 2009.

#### (30) Foreign Application Priority Data

Nov. 11, 2008 (EG) ...... 2008111840

(51) **Int. Cl. A61B 17/70** (2006.01)

(52) U.S. Cl. CPC ...... A61B 17/7014 (2013.01); A61B 17/7001 (2013.01); A61B 17/701 (2013.01); (Continued)

# (10) Patent No.: US 9,510,865 B2

(45) **Date of Patent: Dec. 6, 2016** 

# (58) Field of Classification Search

CPC ...... A61B 17/7053 See application file for complete search history.

(56) References Cited

## U.S. PATENT DOCUMENTS

2,774,350 A 3,242,922 A 12/1956 Cleveland, Jr. 3/1966 Thomas (Continued)

#### FOREIGN PATENT DOCUMENTS

DE 2644735 A1 4/1977 DE 2845647 A1 5/1980 (Continued)

#### OTHER PUBLICATIONS

Machine English translation of Fortin et al WO 2006/010844, Jan. 8, 2016.\*

#### (Continued)

Primary Examiner — Jan Christopher Merene (74) Attorney, Agent, or Firm — Carter, DeLuca, Farrell & Schmidt, LLP

## (57) ABSTRACT

Growth directed correction of a spine via apical vertebral control includes securing a correction system to a first vertebra and a second vertebra of the spine, the correction system defining a correction axis extending between the first and second vertebra and securing the correction system to a third vertebra intermediate the first and second vertebra, the correction system securing the third vertebra at a fixed distance from the correction axis. The correction system is secured to the first and second vertebra such that the first and second vertebra are able to grow away from one another in a direction substantially parallel to the correction axis.

# 5 Claims, 6 Drawing Sheets

